Detailed Specifications for DFIG based Wind Emulator

DFIG based Wind Emulator Setup:

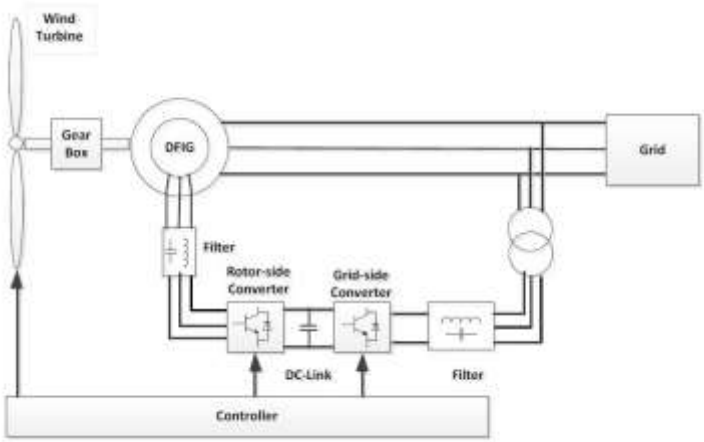


Fig. 1 DFIG based WECS

Specifications:

S. No.	Component	Specification
1	**DFIG** • Rating • Stator voltage • Stator Current • Rotor Voltage • Rotor current • Rated RPM	 2 kVA 415V 5 A 200 V 3 A 1000
2	**DC Motor** • Power • Input voltage • Input Current • Field Voltage • Field Current • RPM	 3 kW 220 V 13 A 220 V 5 A 1500
3	**Buck Converter for DC motor** • Input voltage • Output Voltage	 250 V 0- 220 V (DC)

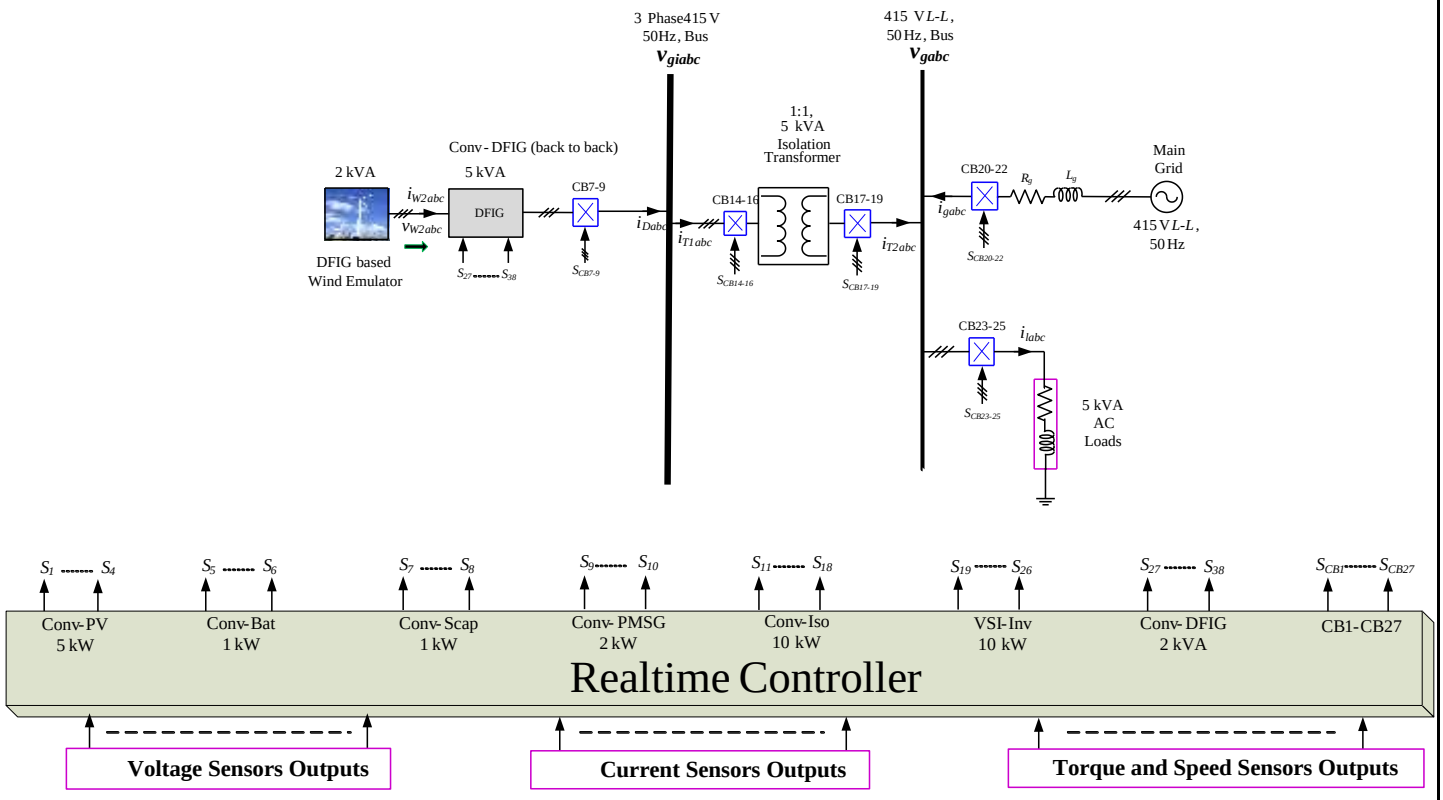
	• Output Current • Switching Frequency • Inductor Value • Capacitor Value	20 A 15 kHz 10 mH, 50 A 2200 µF, 220 V
4	**DFIG Converters** • Numbers • Rating • DC link Voltage • DC link Capacitors • Switching Frequency	 2 5 kVA 50-700V 3600µF,600V 10-20 kHz
5	**Torque Sensor** • **Specifications**	Torque and speed sensor with necessary software to view graphically in host system. Torque range: 0 to 30 Nm Speed range: 0 to 2000 rpm
6	**Sensors** • 10 Voltage Sensors • 9 Current Sensors • Type	 LEM based Sensors
7	**Tacho-Generator** • Input Voltage • Speed Encoding	 24V DC 10V DC for 2000 RPM
8	**Synchronizing Device**	Synchro scope
9	**Inverter and Converter Gate Firing circuits**	Opto-coupler based PCB provision for step up 3.3 V/ 5V PWM signals to 15 V
10	**Bridge Rectifier for DC Motor** • Rating • Capacitor	 35A, 600V 3300µF, 450V
11	**Measurement** • DC Voltmeter	 0-1000 V (2)

	• DC Ammeter • DC Link Voltage Voltmeter • Armature Voltage Voltmeter • Field Voltage Voltmeter	0-50 A (2) 0-1000 V (1) 0-1000 V (1) 0-1000 V (1)
12	**Filters** • LCL filters Value • LC Filters Value	 3 mH/25A, 10 µF/250V, 1 mH/25A 5 mH/2.5A, 20 µF **Note:** All Inductors must be tapped with 5-7 tapings ranging from 0-10 mH.
13	**Autotransformer Single Phase** • Voltage Range • Max. Current	 0-250 V 5 Amp
14	**Autotransformer Three Phase (For Motor)** • Voltage Range • Max. Current	 0-450 V 20 Amp
15	**Autotransformer Three Phase (For Grid)** • Voltage Range • Max. Current	 0-450 V 15 Amp

Additional Requirements:

- Necessary check points should be provided for sensing the control signals.
- Necessary software, cables, connectors, protection circuit and other accessories should be provided.

System Circuit Diagram



Note to Vendors:

1. Vendors should interface the wind emulator setup with any given control platform in the laboratory at IIT Madras. Therefore, installation and transportation charges must be included in the quotation.
2. The bid should be accompanied with detailed product specifications and relevant datasheets supporting the compliance with the required specifications.
3. Product should be supplied with a warranty, minimum of 5 years from the date of installation.